

Mastech MS8268
HANDHELD DIGITAL MULTIMETER
OPERATOR'S INSTRUCTION MANUAL



<http://www.chargerbuy.com>



Table of Contents

<i>TITLE</i>	<i>PAGE</i>
1. GENERAL INSTRUCTIONS	1
1.1 Precaution safety measures	1
1.1.1 Preliminary	1
1.1.2 During use	2
1.1.3 Symbols	4
1.1.4 Instructions	4
1.2 Safety mechanisms	5
2. DESCRIPTION	6
2.1 Instrument Familiarization	6
2.2 LCD Display	7
2.3 Keypad	9
2.4 Terminals	10
2.5 Rotary switch	11
2.6 Accessories	11
3. FUNCTION DESCRIPTION	12
3.1 General Functions	12
3.1.1 Misconnection alarm system	12
3.1.2 DATA HOLD mode	13
3.1.3 Manual ranging and Autorange mode	13
3.1.4 Battery Saver	14
3.1.5 Relative measurement mode	14
3.2 Measurement Functions	15
3.2.1 AC and DC Voltage measurement	15

Table of Contents

<i>TITLE</i>	<i>PAGE</i>
3.2.2 Resistance measurement	16
3.2.3 Diode Test	17
3.2.4 Continuity Check	18
3.2.5 Transistor measurement	18
3.2.6 Capacitance measurement	19
3.2.7 Frequency and Duty Cycle measurement	20
3.2.8 Current measurement	22
4. TECHNICAL SPECIFICATIONS	23
4.1 GENERAL SPECIFICATIONS	23
4.2 Measurement specifications	24
4.2.1 DC Voltage	24
4.2.2 AC Voltage	25
4.2.3 Resistance	25
4.2.4 Audible continuity	25
4.2.5 Diode	26
4.2.6 Transistor	26
4.2.7 Capacitance	26
4.2.8 Frequency	26
4.2.9 DC CURRENT	28
4.2.10 AC CURRENT	28
5. MAINTENANCE	29
5.1 General Maintenance	29
5.2 Fuse replacement	29
5.3 Battery replacement	30

1. GENERAL INSTRUCTIONS

This instrument complies with IEC 1010-1 (61010-1@IEC: 2001), CAT. II 1000V and CAT. III 600V overvoltage standards. See Specifications.

To get the best service from this instrument, read carefully this user's manual and respect the detailed safety precautions.

International symbols used on the Meter and in this manual are explained in chapter 1.1.3

1.1 Precautions safety measures

1.1.1 Preliminary

* Measurement category III is for measurements performed in the building installation.

NOTE: Examples are measurements on distribution boards, circuit-breakers, wiring, including cables, bus-bars, junction boxes, switches, socket-outlets in the fixed installation, and equipment for industrial use and some other equipment, for example, stationary motors with permanent connection to the fixed installation.

* Measurement category II is for measurements performed on circuits directly connected to the low voltage installation.

NOTE: Examples are measurements on household appliances, portable tools and similar equipment.

* Measurement category I is for measurements performed on circuits not directly connected to MAINS.

NOTE: Examples are measurements on circuits not derived from MAINS, and specially protected (internal) MAINS derived circuits. In the latter case, transient stresses are variable; for that reason, requires that the transient withstand capability of the equipment is made known to the user.

* When using this Multimeter, the user must observe all normal safety rules concerning:

- Protection against the dangers of electric current.
- Protection of the Multimeter against misuse.

* For your own safety, only use the test probes supplied with the instrument. Before use, Check that they are in good condition.

1.1.2 During use

* If the meter is used near noise generating equipment, be aware that display may become unstable or indicate large errors.

* Do not use the meter or test leads if they look damaged.

* Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

* Use extreme caution when working around bare conductors or bus bars.

* Do not operate the meter around explosive gas, vapor, or dust.

* Verify a Meter's operation by measuring a known voltage. Do not use the Meter if it operates abnormally. Protection may be impaired. When in doubt, have the Meter serviced.


* Uses the proper terminals, function, and range for your measurements.

* When the range of the value to be measured is unknown, check that the range initially set on the multimeter is the highest possible or, wherever possible, choose the autoranging mode.

* To avoid damages to the instrument, do not exceed the maximum limits of the input values shown in the technical specification tables.










* When the multimeter is linked to measurement circuits, do not touch unused terminals.

- * Do not apply any voltage measurement between the 10A terminal and the COM terminal.
- * Caution when working with voltages above 60Vdc or 30Vac rms. Such voltages pose a shock hazard.
- * When using the probes, keep your fingers behind the finger guards.
- * When making connections, connect the common test lead before connecting the live test lead; when disconnecting, disconnect the live test lead before disconnecting the common test lead.
- * Before changing functions, disconnect the test leads from the circuit under test.
- * For all dc functions, including manual or auto-ranging, to avoid the risk of shock due to possible improper reading, verify the presence of any ac voltages by first using the ac function. Then select a dc voltage range equal to or greater than the ac range.
- * Disconnect circuits power and discharge all high-voltage capacitors before testing resistance, continuity, diodes, or capacitance.
- * Before measuring current, check the meter's fuse and turn off power to the circuit before connecting the meter to the circuit.
- * Never perform resistance or continuity measurements on live circuits.
- * In TV repair work, or when carrying out measurements on power switching circuits, remember that high amplitude voltage pulses at the test points can damage the multimeter. Use of a TV filter will attenuate any such pulses.
- * Use three 1.5V AAA batteries, properly installed in the Meter's battery case, to power the Meter.

- * Replace the batteries as soon as the battery indicator () appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.
- * Do not measure voltages above 600V in Category III, or 1000V in Category II installations.

1.1.3 Symbols:

Symbols used in this manual and on the instrument:

	Caution: refer to the instruction manual. Incorrect use may result in damage to the device or its components.
	Dangerous voltage may be present.
	AC (Alternating Current)
	DC (Direct Current)
	AC or DC
	Earth ground
	Double insulated
	Fuse
	Conforms to European Union directives

1.1.4 Instructions

- * Remove test leads from the Meter before opening the Meter case or battery cover.
- * When servicing the Meter, use only specified replacement parts.
- * Before opening up the instrument, always disconnect from all sources of electric current and make sure you are not charged with static electricity, which may destroy internal components.

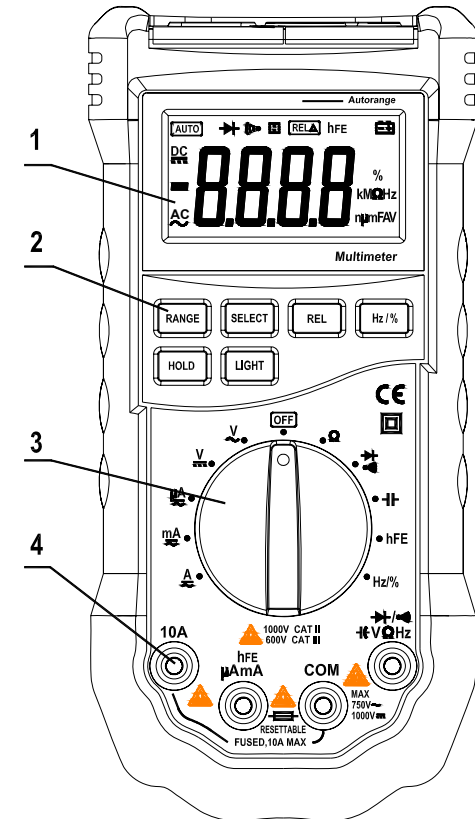
- * Any adjustment, maintenance or repair work carried out on the meter while it is live should be carried out only by appropriately qualified personnel, after having taken into account the instructions in this present manual.
- * A "qualified person" is someone who is familiar with the installation, construction and operation of the equipment and the hazards involved. He is trained and authorized to energize and de-energize circuits and equipment in accordance with established practices.
- * When the instrument is opened up, remember that some internal capacitors can retain a dangerous potential even after the instrument is switched off.
- * If any faults or abnormalities are observed, take the instrument out of service and ensure that it cannot be used until it has been checked out.
- * If the meter is not going to be used for a long time, take out the battery and do not store the meter in high temperature or high humidity environment.

1.2 Safety mechanisms

- * Misconnection alarm system
- * If the maximum range is repeatedly exceeded, a continuous audible signal warns the user in DCV, ACV, DC μ A, AC μ A, DC mA, AC mA, DC 10A and AC 10A functions.

2. DESCRIPTION

2.1 Instrument Familiarization



1. LCD display 2. Keypad 3. Rotary switch 4. Terminals

2.2 LCD Display

See Table 1 indicated for information about the LCD display.

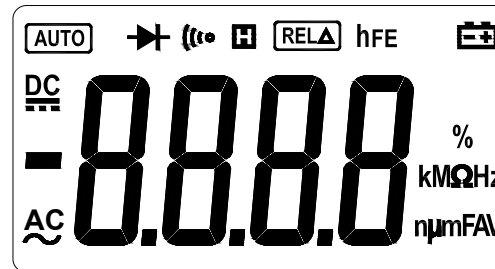


Table 1. Display Symbols

Symbol	Meaning
	The battery is low. <i>Warning: To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator appears.</i>
	Indicates negative readings.
	Indicator for ac voltage or current. AC voltage and current are displayed as the average of the absolute value of the input, calibrated to indicate the equivalent rms value of a sine wave.
	Indicator for dc voltage or current.
AUTO	The Meter is in the Autorange mode in which the meter automatically selects the range with the best resolution.

Table 1. Display Symbols (continued)

Symbol	Meaning
RELΔ	Indicator for the Relative measurement.
	Indicator for the Diode Test mode
hFE	Indicator for the transistor test mode
	Indicator for the Continuity Check mode.
	Indicator for the Data Hold mode
V, mV	V: Volts. The unit of voltage. mV: Millivolt. 1×10^{-3} or 0.001 volts.
A, mA, μA	A: Amperes (amps). The unit of current. mA: Milliamp. 1×10^{-3} or 0.001 amperes. μA: Microamp. 1×10^{-6} or 0.000001 amperes
Ω, kΩ, MΩ	Ω: Ohm. The unit of resistance. kΩ: Kilohm. 1×10^3 or 1000 ohms. MΩ: Megohm. 1×10^6 or 1,000,000 ohms.
Hz, kHz, MHz	Hz: Hertz. The unit of frequency in cycles/second. kHz: Kiloherzt. 1×10^3 or 1000 hertz. MHz: Megahertz. 1×10^6 or 1,000,000 hertz.
μF, nF	F: Farad. The unit of capacitance. μF: Microfarad. 1×10^{-6} or 0.000001 farads. nF: Nanofarad. 1×10^{-9} or 0.000000001 farads.
%	%: Percent. The unit of Duty cycle.
OL	The input is too large for the selected range.

2.3 Keypad

See Table 2 indicated for information about the keypad operations.

Table 2. Keypad


Key	Function	Operation performed
RANGE	V~, V \Rightarrow , Ω , mA and μ A	<ol style="list-style-type: none"> 1. Press RANGE to enter the manual ranging mode. 2. Press RANGE to step through the ranges available for the selected function. 3. Press and hold RANGE for 2 seconds to return to autoranging.
SELECT	 A, mA and μ A <i>Power-up Option</i>	Switches between Diode Test and Continuity check. Switches between dc and ac current. <i>Disables automatic power-off feature.</i>
REL	Any switch position	Press REL to enter and exit the Relative measurement mode.
Hz/ %	V~, A, mA and μ A.	<ol style="list-style-type: none"> 1 Press to start the frequency counter. 2 Press again to enter duty cycle (duty factor) mode. 3 Press again to exit the frequency counter mode.


Table 2. Keypad(continued)

Key	Function	Operation performed
HOLD	Any switch position	Press HOLD to enter and exit the Data Hold mode.
LIGHT	Any switch position	Press to turn the backlight on. The backlight will be auto-off about 5 seconds later.

2.4 Terminals

See Table 4 indicated for information about the terminals.

Table 4. Terminals

Terminal	Description
COM	Return terminal for all measurements. (Receiving the black test lead or the “com” plug of the special multi-function socket)
 V Ω Hz	Input for voltage, resistance, capacitance, frequency, diode and continuity measurements. (Receiving the red test lead or the “+” plug of the special multi-function socket).
hFE μA mA	Input for hFE and 0.001mA to 400mA current measurements. (Receiving the red test lead or the “+” plug of the special multi-function socket)
10A	Input for 400mA to 10A current measurements. (Receiving the red test lead).

2.5 Rotary switch

A eleven-position rotary selector switch gives access to the following quantities:

- Current: 10A
- Current: mA
- Current: μ A
- DC Voltage
- AC Voltage
- OFF: off position
- Resistance
- Diode and Continuity (with beep)
- Capacitance
- Transistor: hFE
- Frequency

2.6 Accessories

Delivered with the multimeter:

- User's manual
- Test leads
- Special Multi-function socket

3. FUNCTION DESCRIPTION

3.1 General Functions

3.1.1 Misconnection alarm system

The input terminals of the meter are equipped with sound and light alarms against misconnection of test leads.

At V, Ω , $\rightarrow|$ and $\rightarrow|$ ranges:

- 1 The red lights at the "V" and "COM" terminals will be off after the test leads are plugged in.
- 2 The buzzer will sound upon misconnection of the test leads in the "mA" or "10A" terminals to warn the user. At the same time, the lights at the "V" and "COM" terminals will flash to remind the user to plug in the test leads there.

At μ A, mA, and hFE ranges:

- 1 The red lights at the "mA" and "COM" terminals will be off after the test leads are plugged in.
- 2 The buzzer will sound upon misconnection of the test leads in the "V" or "10A" terminals to warn the user. At the same time, the red lights at the "mA" and "COM" terminals will flash to remind the user to plug in the test leads there.

At A range:

- 1 The red lights at the "10A" and "COM" terminals will be off after the test leads are plugged in.
- 2 The buzzer will sound upon misconnection of the test leads in the "V" or "mA" terminals to warn the user. At the same time, the lights at the "10A" and "COM" terminals will flash to remind the user to plug in the test leads there.

3.1.2 DATA HOLD mode

Data Hold mode makes the meter stop updating the display. Enabling Data Hold function in autorange mode makes the meter switch to Manual ranging mode, but the full-scale range remains the same. Data Hold function can be cancelled by changing the measurement mode, pressing **RANGE** key, or push **HOLD** key again.

To enter and exit the Data Hold mode:

1. Press **HOLD** key (short press). Fixes the display on the current value, “**H**” is displayed.
2. A second short press returns the meter to normal mode.

3.1.3 Manual ranging and Autorange mode

The Meter has both manual ranging and autorange options.

- * In the autorange mode, the Meter selects the best range for the input detected. This allows you to switch test points without having to reset the range.
- * In the manual ranging mode, you select the range. This allows you to override autorange and lock the meter in a specific range.
- * The Meter defaults to the autorange mode in measurement functions that have more than one range. When the Meter is in the autorange mode, **AUTO** is displayed.

To enter and exit the manual range mode:

1. Press **RANGE** key. The Meter enters the manual ranging mode. **AUTO** turns off. Each presses of **RANGE** key increments the range. When the highest range is reached, the Meter wraps to the lowest range.

NOTE: If you manually change the measurement range after entering the Data Hold modes, the Meter exits this mode.

2. To exit the manual ranging mode, press and hold down **RANGE** key for two seconds. The Meter returns to the autorange mode and **AUTO** is displayed.

3.1.4 Battery Saver

The Meter enters the "sleep mode" and blanks the display if the Meter is on but not used for 15 minutes.

Press the **HOLD** key or rotate the rotary switch to wake the meter up.

To disable the Sleep mode, hold down the **SELECT** key while turning the meter on.

One minute before power off, the beeper will sound 5 sounds. The beeper will sound again before power off.

3.1.5 Relative measurement mode

The Meter will display relative measurement in all functions except frequency.

To enter and exit the relative measurement mode:

1. With the Meter in the desired function, touch the test leads to the circuit on which you want future measurement to be based.
2. Press **REL** key to store the measured value and activate the relative measurement mode. The difference between the reference value and subsequent reading is displayed.
3. Press **REL** key for more than 2 seconds to return the Meter to normal operation.